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THE TECHNOLOGICAL NATURE AND THE POTENTIAL WAYS OF COMMERCIALIZATION OF MOBILE APPLICATIONS IN THE SPORTS AND FITNESS INDUSTRY IN 2020

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Abstract

The assignment was given by Viveca, a reseach organization of the University of Jyväskylä. The purpose of the research was to find out the technologies and the most potential ways of commercialization that can be forecast to create customer value in 2020 in the field of mobile applications used in sports and fitness.

The first part of the research consists of a futures research where the author applied secondary data to gather information about future megatrends and technologies. In this part of the research, the author created a view on the most probable development paths for technologies and society. Here, the methodology consists of environmental scanning and multiple perspective analysis. Additionally, a technology roadmap is presented to show the development path of the potential technological interface of the future applications of sports and fitness in a visual form.

Marketing literature was applied in choosing a potential target segment for future applications. The results of the futures research were also used in choosing the target segment. The final part of the research consists of a qualitative research where expert interviews were applied to produce new data. The main purpose of the interviews was to find out how the actual marketing of the forecast technological interface could be conducted efficiently for the chosen target segment.

As the result of the research, the author found that certain technological development paths will create a new technological interface for the future applications. Considering marketing, the author discovered a potential target segment for the future applications. As a result of the qualitative analysis, the author found important factors that can be expected to create competitive advantage when marketing the future application technology for the chosen segment. From the reliability point of view, the research approach is thoroughly reported. The most important limitation was the unsure nature of future. Ideas for further research were given.

Keywords
Marketing, High-Tech Management, Mobile Applications, Sports, Fitness, Future, Qualitative Research

Miscellaneous

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LIIKUNTA- JA FITNESSMOBIILISOVELLUSTEN TEKNOLOGINEN LUONNE JA POTENTIAALISET KAUPALLISTAMISKEINOT VUONNA 2020

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Työn toimeksiantajana toimii Viveca, Jyväskylän Yliopiston alainen tutkimuslaitos. Tutkimuksen tarkoituksena oli löytää teknologioita ja kaupallistamiskeinoja joiden voidaan olettaa luovan arvoa vuonna 2020 urheilu- ja fitnesstarkoitukseen käytettäviä mobiilisovelluksia markkinoitaessa.

Tutkimuksen ensimmäinen osa koostuu tulevaisuuskartoituksesta jossa on käytetty toissijaisia lähteitä. Täten on saatu tietoa tulevaisuuden megatrendeistä ja teknologioista. Tutkimuksen tässä osassa kuvaillaan potentiaalisimmat kehityspolut teknologioiden ja yhteiskunnan kehitykselle. Metodeina mainitussa tulevaisuutta käsittelevässä osiossa on käytetty ympäristön kartoitusta ja moniperspektiivianalyysia. Lisäksi tekijä kuvaa tutkimuksen perusteella hahmottelemansa tulevaisuuden liikunta- ja fitness-sovelluksiin soveltuvan teknologisen rajapinnan kehitystä visuaalisesti technology roadmapilla.

Tutkimuksessa on käytetty hyväksi markkinointikirjallisuutta potentiaalisen kohdesegmentin valinnassa. Myös tulevaisuuskartoituksen tuloksia on hyödynnetty segmentin valinnassa. Tutkimuksen viimeinen osa koostuu kvalitatiivisesta analyysistä jossa asiantuntijahaastatteluja on hyödynnetty uuden datan tuottamiseksi. Haastattelujen tarkoitus oli selvittää kuinka löydetyn teknologisen rajapinnan markkinointi tulisi suorittaa valitulle kohdesegmentille.

Tutkimuksen tuloksena löydettiin eräiden teknologisten kehityspolkujen johtavan uuteen teknologiseen rajapintaan jota voidaan käyttää tulevaisuuden liikuntasovelluksissa. Markkinoinnin osalta löydettiin potentiaalinen kohdesegmentti kyseisille tulevaisuuden sovelluksille. Kvalitatiivisen analyysin tuloksena löydettiin tärkeitä tekijöitä joiden voidaan odottaa tuottavan kilpailuetua markkinoitaessa tulevaa sovellusteknologiaa kyseiselle segmentille. Reliabiliteetin kannalta tutkimusote on perusteellisesti kuvailtu. Suurin rajoite on tulevaisuuden epävarma luonne. Tutkimuksen pohjalta löydettiin ideoita jatkotutkimuksille.

Avainsanat (asiasanat)
Markkinointi, High-Tech Management, Mobiilisovellukset, Urheilu, Fitness, Tulevaisuus, Kvalitatiivinen analyysi

Muut tiedot

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

The thesis was assigned by Viveca, a research organization of the University of Jyväskylä. The author was given a task to research business opportunities and factors that would create customer value in 2020 in the markets of mobile applications applied for sports and fitness purposes. The research questions in this thesis were:

“Which technologies can be forecast to create customer value in 2020 in the area of sports and fitness mobile applications?”

“What would be a proper target segment for these applications?”

“Which would be the most efficient ways to conduct the marketing of the forecast application technology for this segment?”

The first part of the thesis consists of a description of the industry, followed by a description of methodology and theoretical knowledge base. A futures research, starting from a macro level, is applied as the first tool of data collection. Its purpose was to discover universal patterns considering global development, especially in technology. Using the patterns found in this research, it was possible to find out how the general development of the surrounding world will most probably impact the industry, technology, society and the markets.

By applying the results of the futures research, it was possible to find applicable future technologies and a target segment for the future applications of the field. Marketing literature was also applied in segmentation. A technology roadmap is presented to illustrate the development of the forecast application technology. The latter part of the thesis consists of an analysis of how the actual marketing of the future applications of this field could be conducted efficiently for the chosen target segment. Marketing-related expert interviews as a tool of qualitative analysis were applied to create new data. As a conclusion, the results and further research ideas are presented based on the findings. A flow chart of the research process is attached in the appendices.

2 DESCRIPTION OF THE INDUSTRY

2.1 Nature and scope of the industry

The sports and wellness industry is a rather vague term and calling it a specified industry might be somewhat disorienting. However, there are multiple industries that create a genre that can be named as “Sports and Wellness Industry”. Examples of the industry are fitness and gym services, wellness trainers, sports equipment manufacturers, sports clothing manufacturers and distribution channels, such as retail brands. For this thesis, one peculiar sector are sports instruments manufacturers as Suunto that act on the interface of the sports and information technologies (Suunto 2014).

The whole industry can be summed up as a broad variety of enterprises meeting consumer needs in sports and wellness with each business having their own way to meet the customers’ needs and create customer value. There are industries concentrating only on the wellness sector, such as the beauty industry, spa companies etc. which need different types of applications from those needed in the actual sports and fitness field. Applications concerning the actual physical training and exercise were focused on in this research and thus, the chosen genre of applications are the sports and fitness applications. The sports and fitness industry can co-operate with information technology in the companies that already directly act on the interface of the two industries, for example metering instrument providers and mobile application developers or, on the other hand, those acting on the interface indirectly such as clothing and equipment manufacturers.

2.2 Description and market overview of the sports and fitness applications

The most common mobile applications used in sports, fitness and exercise are tracking applications and other metering software with some of them for professional use and with additional accessories. Many applications combine metering, tracking, navigation and social networking and they support the user to

reach the goals of the training. Polar Electro (Polar 2014), a Finnish manufacturer of heart rate monitors, is a good example of a supplier that provides mobile applications for metering, accompanied with physical equipment. Polar Beat is a perfect example of an application mixing these functions. It is an application that applies Bluetooth equipped body sensors combined with software capable of advising the user. It can be directly connected to social media (Polar Beat 2014). Besides Polar Beat, there is a multitude of sports and wellness applications on the market, each with their own characteristics. In AppStore, there were 13 700 applications under the category of “Health and Fitness” in December 2013 (AppStore metrics 2013).

A peculiar service is HeiaHeia, which is a social network for sports and exercise. In HeiaHeia, users can plan their exercises and network with other users. (HeiaHeia 2013.) Other promising sports applications developed in Finland are Omegawave, Moves and Sports Tracker, which Pitkänen (2013) regards as possible boomers in his article on mobile applications. Other excellent examples of companies mixing information technology with sports and outdoor activities are the instrument manufacturers Garmin, Traxmeet and Suunto. These companies have different product categories but they represent the interface of information technology and sport.

The most popular paid health and fitness applications are exercise applications with a 42% share of all distribution, and the second most popular applications are diet and calorie counting applications with a 21% share. Tracking, sleep & symptom checking, “quit smoking” and women’s applications had lower percentages. The sample is from Germany as of May 2013. (Distribution of the most popular paid health and fitness apps in Germany as of May 2013, by category 2013.) It is interesting to see is that fitness and health applications are a boomer. The size of the market is predicted to be worth $ 40 million in 2016, while it was worth $ 12 million in 2010 (Healthy Apps 2012).

The share of health applications is 13% percentage of all mobile applications used in devices (Amazing & thought provoking infographics about mobile apps 2012). It is also notable that women and younger generations are relatively eager to adopt health and fitness apps. According to Pai (2013), especially the age

group of 25-34 years have an interest in these applications: “Millenials… used fitness and health apps twice as much as the average of other age groups. In a gender split, women use health and fitness apps 200 percent more than men do.”

Future outlook

The nature of mobile applications in 2020 cannot be predicted accurately but by the means of the futures research of this thesis it was possible to find the most predictable concepts and pathways of the technological development. It must be understood that the nature of the applications can become totally different from the current ones and the corporations on the market are practically impossible to guess beforehand. However, according to Purvis (2013), the sensor application industry is expected to boom during this decade. Competition in the exercise application markets is fierce, as Pitkänen (2013) reports in his article on application markets.

3 METHODOLOGY AND THE THEORETICAL KNOWLEDGE BASE

3.1 Data collection in the futures research

In the first part of the thesis, futures research, the author used certain methods that are considered universally relevant to analyzing future. First, it was logical to explore evolutionary paths that researchers have found and apply this information. A futures research was the most practical and the most informative way to find the most probable development paths and it could be applied here with the correct methodology. Most importantly, a futures research is a good starting point to find out the most potential megatrends that businesses have to take into account in 2020. All the data collected in the futures research is secondary data.

Environmental Scanning

Environmental scanning, as a method, is used in futurology as a tool to find important concepts or issues in a multitude of material. It can be used in information gathering, decision making and trend spotting. Environmental Scanning as a practice can vary depending on its purpose. To describe the purpose of Environmental Scanning in this research, it is a tool of figuring out the most important development paths of the future, and also a tool of collecting information for a multiple perspective analysis. As a result of the multiple perspective analysis, the development of the industry can be seen more clearly and in a more focused manner.

A general point of view was necessary for this thesis to detect the patterns, trends and global issues that have an impact on the whole Globe, and thus, on the technologies and markets in 2020. This point of view was created by applying the environmental scanning method and providing the results through a PESTEL analysis. Environmental Scanning is a qualitative and exploratory type of research (Saukkonen 2012, 10).

The reason for choosing a qualitative and exploratory type of research, also as the first foundation of the thesis, is the overall suitableness of finding the most potential theoretical development paths and the overall difficulty and relative unsuitability of implementing quantitative and normative methods while researching an unsure concept, which future certainly is. Future cannot be sampled in a way that is natural to most quantitative and normative methods. In this phase, the idea was to find megatrends and other globally important issues that have a nature of high probability and a strong impact on a macro level. Hence, the focus was not on weak signals and relatively insignificant concepts but on megatrends and other relevant and plausible concepts.

Environmental scanning is a good tool to gather information as the first step as the phenomenon is very vague in its nature. By applying environmental scanning, the author could find the megatrends and other plausible concepts that are mentioned in multiple sources. Thus, the requirements of saturation and reliability are met. Glenn and Gordon (2003, 3) note about the suitability of environmental

scanning for futures research in their article on Environmental Scanning in Glenn's Futures Research Methods Series: "All futurists do environmental scanning – some are more organized and systematic, all try to distinguish among what is constant, what changes, and what constantly changes." The author applied environmental scanning by searching for data via online articles, literature and other documents and materials that deal with future and the most plausible, general pathways for the following years.

3.2 Data analysis in the futures research

The multiple perspective analysis can be used to create different viewpoints of a phenomenon. These viewpoints are Technological (T), Organizational (O) and Personal (P) viewpoints. This phase consists of collecting and analyzing the most relevant and important themes for the sports and fitness mobile application industry included in the universal trends described in the PESTEL. The method of multiple perspective analysis is qualitative, exploratory and in addition, normative as well (Saukkonen 2012, 10). This method is applicable for an analysis with a more narrow scale from the Environmental Scanning and it deepens understanding on the key signals that are collected in it.

As the environmental scanning and PESTEL were used merely for simply collecting the overall future themes, the most important themes concerning the industry were viewed and analyzed more intensely and more deeply in the multiple perspective analysis. By conducting a multiple perspective analysis, certain technologies that will, assumingly, meet the needs of this particular, comparably scoped market were found. Besides this, patterns, trends and connections were found out to support in making a decision on the correct market segment.

The nature of this particular TOP analysis differs from its traditional sense in a way that the organizational part is widened to consider the whole society as an organization. The personal part was applied to consider the consumer. According to Linstone (2003, 11), "There is much flexibility in applying the concept" and "O and P are case-specific". This transformation is also accepted by the supervisor

of this thesis. The results of this multiple perspective analysis were applied as follows: The Organizational and Personal findings were used as additional data in deciding the correct market segment for the applications as certain demographic groups and demographic concepts were found.

Description of a Technology Roadmap

The technological findings of the TOP analysis were applied in building a technology roadmap where the development of the most relevant technologies concerning the industry were forecast. A technology roadmap was applied to graphically illustrate the development pace of the technologies the author expects to become crucial in the chosen market. With the results of the multiple perspective analysis and by using additional secondary data, it was possible to forecast the time frame of the development of the technologies that are the most important to the industry. According to Gordon (2003, 5), a technology roadmap can be applied to illustrate different steps in product development.

3.3 Background to segmentation

The author chose a proper target segment for the future applications based on the findings of the multiple perspective analysis. By applying marketing literature, certain additional factors could be found to separate one group of people from another.

Referring to Moore (1991), Mohr (2001) states that there are five categories of adopters of new innovations; innovators, early adopters, early majority, late majority and laggards. It can be said that the first two categories, innovators and early adopters, are the most welcoming for new technologies and comparably eager to adopt them for use. (pp. 151-153.) Mohr (2001) describes the group of innovators as ”Fundamentally committed to new technology”, who like to apply new technological innovations as soon as possible. The early adopters are “The first constituency who can and will bring money on the table. They help to publicize new innovations, which helps give them a necessary boost to succeed in the early market.” (pp. 152.) Mohr (2001, 153) states that the rest three

categories are more sceptical in their nature when adopting new innovations, the early majority also needing certain proof about the innovations as well. According to Hintikka (1999, 209-210), the percentage of innovators from all people is 2.5 % and the percentage of early adopters from all people is 13.5 %.

3.4 Data collection and data analysis in the qualitative research

In this part of the research, the author conducted expert interviews and applied primary data. Before this qualitative analysis, the technological aspects concerning the research problem were already forecast, and a qualitative analysis was used to find ways to conduct the actual marketing of the technological interface for the target segment. A qualitative analysis suited well to this purpose because the subject at hand is future and thus, numerical or quantitative data is not applicable. The author had to create new hypotheses considering the phenomenon. In general, the subject is theoretical and somewhat non-existing in its nature. According to Kananen (2008, 30-32), a qualitative analysis is proper under these circumstances.

The author contacted experts of the field, which of each is following the subject from different perspectives, and received a theoretical sample of five persons as informants. The interviewees were given descriptive, thematic questions related to the subject. The interviews were conducted individually in meetings or as telephone interviews, and the discussions were recorded as audio files and transcribed as verbatim transcriptions. The experts were presented with the main findings of the futures analysis, mostly concerning the technologies applicable for the industry. Besides, the chosen target segment was described. According to Kananen (2008, 78), it is proper to use detailed questions and clear themes in expert interviews. The interview questions are listed in the Appendix. The author analyzed the transcribed answers by finding the most common themes the interviewees noted. Coding was used to indicate different themes in the transcriptions. The lengths of the interviews varied from nine to 25 minutes, depending on the interviewee. The interviewees are listed in Table 1 (p. 11).

TABLE 1: A list of interviewees in the qualitative analysis

Interviewees
1. A director and partner in a Finnish information security corporation
2. A senior lecturer of wellness and healthcare in a Finnish university of applied sciences
3. A Slovenian expert of future businesses and technology
4. A mid-level manager in a Finnish information technology corporation
5. A former Finnish consultant

4 FUTURES RESEARCH BY ENVIRONMENTAL SCANNING

The author collected themes that are megatrends or other important concepts that are noted in multiple secondary sources. The weight was on the economical, sociological and technological themes of the PESTEL variety, but the most important political, environmental and legal themes were included as well. *Weak signals* that have a certain weight in futurology were not used. Weak signals are too unsure in their nature to be mentioned and Mannermaa (2004, 117) describes that “their development is difficult to model”. The chosen themes are relevant, global development paths with high plausibility and high importance on a global scale. A good example of a concept with these characteristics is a megatrend. (Mannermaa 2004, 44.)

As a note, certain universally acknowledged megatrends, especially in technology were set aside or combined together as one general theme if proper. The reason for this classification was to avoid collecting too many less important signals concerning the subject and ease the analysis by categorization. As an example, genetics or green business that are megatrends (Mannermaa 2004, 62-66) were not listed due to the fact that they can be summed up under other

chosen themes and they have a very minimal relevance to the subject per se. Wide concepts like nanotechnology were listed as a single theme without the necessity to describe all its numerous applications. Additionally, certain themes that first seem irrelevant to the subject were included if they have a significance on the industry or on the markets. This can be seen especially in the political, sociological and legal categories. These themes can have an indirect impact on the industry and the markets.

According to most sources, globalization is the most important megatrend of this (2010-2020) decade. Despite the importance of globalization as a vague phenomenon, it is, according to Mannermaa (2004, 59), necessary to see the role of technology as the "prime mover" of all other trends, including globalization. When speaking about economic forecasts, it must be remembered that no one can predict future accurately. Vast surprises can come instantly and econometric models are not proper trend creators, as Mannermaa (2004, 23-25) notes. He also states that econometrical forecasts must not be taken as an accurate truth but “They indicate the development if the current situation continues unchanged” (Mannermaa 2004, 23-25). Hence, econometric forecasts do not have relevance per se but the author thinks that they are critical for the expectations on the consuming patterns and marketing environment on a general level. As cited, technology is the prime mover of general development and trends now, and also on a scale of decades as well (Mannermaa 2004, 117).

TABLE 2: Illustration of the findings of the environmental scanning in a PESTEL scale with sources below

POLITICAL THEMES
- Globalization
- Multipolar World
- Rise of Asia
- Constant War

- Global uncertainty and Complex Risk Society
- Structural differences

ECONOMIC THEMES
- Growing middle class and prosperity in booming economies **- A new economical World Map**
- Revolution in business ecosystem and work habits in service sector
- Outsourced Customer Service
- Applying open data to adjust marketing and services to consumers
- Compassionate corporation and consumption
- Global Economy and Expansion on a micro level as parallel phenomena
- Clash of value creation in Knowledge Economy vs. Transformation Economy

SOCIOLOGICAL THEMES
- Urbanization in the Third World
- Polarization in the West
- Generation Y as fast adopters of innovations
- Feminism
- Reverse Brain Drain back to developing countries
- Health problems, wellness, well-being and spirituality
- Growing speed of Change
- New attitudes towards living and enhanced mobility
- Ageing in the West

- Individualism vs. Collectivism
- Cultural Integration vs. Growing Similarity
- 24/7 Society

TECHNOLOGICAL
- Virtual reality synchronized with the physical & Augmented reality
- Robots in consumer markets
- Evolution of global networks
- Nanotechnology
- Biotechnology and biosociety
- Smart materials
- Sensor Networks
- Artificial intelligence and neuronetworks
- New Battery Technologies

ENVIRONMENTAL
- New, cleaner technologies
- Environmentalism
- New sources of Energy

LEGAL
- Legislations to protect the environment
- "Big Brother" and public surveillance

(Mannermaa, 2004; Consumer 2020 - Reading the Signs, 2011; Brand & Locchi, 2011; Daheim, 2009, Mogensen, et. al; 2011 Vuoden Kuvat ja Puheenaiheet, 2011; Lyhyesti, 2012, 10; Vikström, 2013, 13; Gartner's 2012 for Emerging Technologies Identifies "Tipping Point" Technologies That Will Unlock Long-Awaited Technology Scenarios, 2012; Outram, 2009; Service 2020: Megatrends for the Decade Ahead, 2011; Mega Trends and Implications to Business, Society and Cultures, 2010; Finin, 2011)

5 MULTIPLE PERSPECTIVE ANALYSIS BY TOP ANALYSIS METHOD

5.1 Introduction to the multiple perspective analysis

In this analysis, the very first objective was to choose the themes of development that have the largest and an accurate impact on the industry. The chosen themes have a direct implication in the future development of the industry. These themes are mostly technological in their nature and they describe the development of the actual scene of sports and fitness mobile applications. The themes set aside have relatively less significance in the industry. Despite the fact that some classification was applied in the environmental scanning, its purpose was to find general development lines for 2020. However, this multiple perspective analysis is for analyzing the accurate industry and the development concerning its technologies and markets. The chosen themes are described and analyzed below.

5.2 Chosen themes with the author's analyses included

The growing middle class and prosperity in booming economies

In macroeconomics, the size and the purchasing power of the middle class indicates the wealth of an economy and it is widely acknowledged that the middle class in populous, booming economies is growing (Mogensen, Erikesen & Johnson). This will create new economic superpowers. As the middle class grows, their purchasing potential of consumer products follow the growth (Consumer 2020 - Reading the Signs 2011, 5-6; Mega Trends and Implications to Business, Society and Cultures 2010, 4).

Applying open data to adjust marketing and services to consumers

The development of social media, the rapid growth of consumer data and the possibility of tracking consumer's interests create a new dimension to marketing. This can allow personalized customer contacts and optimized advertising via the electronic platforms of the future. (Service 2020: Megatrends for the Decade

Ahead 2011, 9-10.) The author believes that customer data can be implemented in sports applications and it could be utilized in marketing as well.

Polarization

In the Western economies, economic progress combined with social problems is forecast to grow the gap between the income groups. This would create a society with polarized cultures of "first" and "second" classes of people. (Mannermaa 2004, 220.) The author states that identifying the segments with a higher purchasing potential and an interest for the sports and fitness applications is crucial for the marketing of the applications.

Generation Y

The generation born approximately between 1980 and 2000 will be mainstream consumers in 2020. This generation has certain characteristics that make it differ from the previous generations. These characteristics include fast adoption of new innovations, fluency with the modern technologies and a relative easiness of life compared to previous generations. As this generation has an ability to adapt with new innovations and this generation will be on the age scale from 20 to 40 years in 2020, they are a very potential target group for the industry. “Generation Y will be the most adaptive to change, ready to experiment with new technologies with high purchasing power". (Mega Trends and Implications to Business, Society and Cultures 2010, 4.)

Health problems, wellness and well-being

Practically, there are two separate megatrends in this field but in this thesis they are combined under the same headline. Firstly, health problems are expanding everywhere on the planet (Mogensen, Erikesen & Johnson) and the healthcare industry will have both a challenge and an opportunity ahead as both the people and the governments need solutions. Technological innovations are driving this sector strongly forward. Healthcare is one of the sectors that will implement new technological innovations with extremely huge inputs. (Mega Trends and Implications to Business, Society and Cultures 2010, 8.)

The growing importance of wellness is a parallel megatrend (Mega Trends and Implications to Business, Society and Cultures 2010, 7). The wellness industry is

a vague concept with multiple subcategories; Well-being solutions, training applications, personal training, "overall" health solutions as a marketing concept, dietary supporters, spirit-based treatments, etc. “Today fitness has become wellness, and so has gained a more spiritual and personality-optimizing character. New spa baths, treatment resorts, and other offerings are constantly appearing on the market…” (Mogensen, Erikesen & Johnson.)

New attitudes towards living

New technologies allow more mobility, connectedness and, in addition, immobility as well (Mannermaa 2004, 86). Combining this development with new ideas about individual progress and responsibility will, apparently, create a new world view in the Western economies, at least among younger generations (Locchi & Brand 2011, 13, 16-17). The author believes these changes are crucial in consumer marketing.

Ageing in the West

Societies and governments will have a burden of supporting the ageing population and businesses could search ways to use the purchasing power of the so-called grey panthers (Mannermaa 2004, 10). Despite the massive purchasing power of the older generations, the younger generations such as Generation Y have less resistance when adopting new innovations (Mega Trends and Implications to Business, Society and Cultures 2010, 4).

Cultural integration

According to Mannermaa (2004, 105-112), globalization and growing interconnectedness will create new challenges as areal cultures and religions will clash. It is expected that cultures will be in conflict with each other as a parallel phenomenon to cultures melting together as one global culture. There are signals that this global, homogeneous culture will not be a product of American mass culture but, instead, a mixture of acceptance and liberalism that can be seen in Northern Europe already. The author thinks that cultural oneness combined with global health issues could create a global wellness market and its marketing communication could be singularized. However, this scenario has no importance in this thesis because one particular target segment was chosen later.

Virtual reality synchronized with the physical & Augmented reality

What comes to mobile applications, these themes are extremely important. It is highly plausible that the technological progress in this field will create a new reality where virtual and physical realities are being interconnected in a growing speed (Mega Trends and Implications to Business, Society and Cultures 2010, 9). This fusion can create a view of reality that is difficult to be predicted accurately.

Evolution of global networks

Enhanced connectivity, especially in mobile and wireless technologies is a boom (Mega Trends and Implications to Business, Society and Cultures 2010, 6). Smart clouds, higher processing speed in cloud, extremely fast wireless connection anywhere and global networks basing on fiber optics are already a growing subject of testing (Gartner's 2012 for Emerging Technologies Identifies "Tipping Point" Technologies That Will Unlock Long-Awaited Technology Scenarios 2012). Regardless of the actual technologies in use in 2020, it can be already expected by the author that the easiness and the speed of connection will be on a higher level than now (in 2014).

Smart materials

Mannermaa states (2004, 66-70) that based on the results of Futukeys Delphi panel (2003) there are new possibilities to create an interface of materials and intelligence. Both nanotechnology and biotechnology, added with the growing understanding on the nature of materials will allow materials to become intelligent as chemical structures could be used in information processing (Hintikka 1999, 220-222). The fusion of materials and intelligence can change consumer technology. Smart materials may have large commercial potential during the latter part of the 2010's (Mannermaa 2004, 62-65).

Nanotechnology

According to multiple sources, nanotechnology is one of the most important megatrends and the implementations of nanotechnology will have the largest impact on consumer technology on this decade. Devices can be designed to become extremely small and the ways to apply nanotechnology are expanding. It

is assumed that nanotechnology, as the characteristic of the society, will reach its full potential approximately in 2020, including a revolution of healthcare (Mannermaa 2004, 157).

Biotechnology and biosociety

By implementing new understanding on chemistry and biology, humans are able to create applications of organic and cellular processes and use them as intelligent systems intentionally. Applying technology in a deeper interaction with biological processes is a parallel phenomenon. (Hintikka 1999, 220-222.) According to Mannermaa (2004, 55-58), we are living in a shift from microsociety to nanosociety. The next similar shift will be from nanosociety to biosociety. No one yet knows the implications of this shift but it is plausible that the society will have the potential to change the overall way of living. The author suggests that combining human and technology and implementing human body for technology can be a possibility for the application industry.

Sensor networks

In the end of the 2010's, the World is expected to be covered with multiple sensor networks, as the development of sensor technology will allow the use of minimal, intelligent, nanotechnologically designed sensors. Mannermaa (2004, 60-62, 69) states that according to MIT Technology Preview (2003) and Futukeys Delphi panel (2003), this development path is highly plausible. The author believes that sensor and measurement networks can create a new dimension to the sports and fitness applications.

New battery technologies

Generating energy by extremely small units is being tested and prototypes of future batteries are currently under development. Wireless reloading is already a hype and it is developing with an acknowledgeable speed. However, the situation on this field in 2020 cannot be yet forecast with a proper precision. (Gartner’s 2012 for Emerging Technologies Identifies “Tipping Point” Technologies That Will Unlock Long-Awaited Technology Scenarios 2012). The development of extremely minimal batteries with nanotube technology has also begun (Lyhyesti 2012, 10). One cannot fully predict the accurate innovations that will be actually

implemented in 2020. Despite this, the author can state that smaller battery technologies will exist in some form in 2020.

Environmental issues

Sustainability could have a weight in consumers' choices and this must be noted in consumer markets (Consumer 2020 - Reading the Signs 2011, 14). According to Daheim (2009), the climate change, pollution and other negative footprints of the human civilization will force governments and international organizations to tighten emission, material and consumption legislations. New legislations can reduce the use of certain raw materials and technologies. Shortage of certain resources can also become a fact. (pp. 5.)

5.3 TOP Analysis

This part of the thesis includes the author’s own critical thinking and the author made analyses based on the results of the environmental scanning. The development paths of the key technologies for the sports and fitness applications are presented in chapter 6. The organizational and personal issues were taken into account when deciding a proper target segment for the applications.

5.3.1 Technology

This chapter will combine the chosen technological themes as key areas of interest suggested for the industry. The author analyzed the findings and suggests that there will be certain ways how the technological development could create new platforms for future applications, especially for the hardware and devices. As the purpose of this thesis was to find out potential future hits, the current and previous applications may not be an accurate platform per se, as the technologies may become obsolete. Hence, the focus in the following conclusions is in the future. It is notable that the development of the actual software are rather impossible to be forecast, especially as the speed of technological development is exponential. Despite this, the development of the technical devices themselves is more or less possible. Even the most famous

forecasters such as Gartner haven't considered the software. However, the clash of software with the physical reality can be found in technologies such as augmented reality. (Gartner's 2012 for Emerging Technologies Identifies "Tipping Point" Technologies That Will Unlock Long-Awaited Technology Scenarios 2012.)

5.3.2. Technological development paths suggested by the author

Connectivity and the revolution of digital networks

Enhanced connectivity, development of sensor and measuring networks and virtual reality taking place in the physical reality can create a new ecosystem for the human species. It can be assumed that the fusion of information technology and the physical reality will be in such a scale in 2020 that people can be a part of a functioning interface of the virtual and physical realities.

Combining material, technology and human

As mentioned (op. cit. pp. 18-19), nanotechnology will reach its full potential approximately in 2020, and from approximately 2010 on, biotechnology is growing as a parallel factor. It will become the main characteristic of technological development after the peak of nanotechnology. As nanotechnology is being utilized, very minimal devices are possible, but biotechnological inventions can use biological systems such as cells and organs in information processing.

In addition, a notable trend caused by nanotechnology is the combination of materials and intelligence, known as smart materials. Implications of biotechnology in material sciences are yet challenging to predict as the scientific idea itself allows multiple usages. Most probably, biotechnology and the human body will meet in a same interface, tissue engineering (Mannermaa 2004, 60-62) being a good example. Professor Joni Kämäräinen mentions that human neuronics and technology are being combined through numerous different applications and they can be connected already with information networks. Connection to sensor networks will follow in near future. According to Kämäräinen, "The possibilities to apply this technology are vast, only imagination can restrict it". (Vikström 2013, 13.) Progress in the technological sciences has allowed new methods in energy generation for small devices. Certain innovations

are forecast to reach mass usage, nanowire battery being the most competitive example. (op. cit. pp. 19-20.)

The change in the nature of the sports equipment

Smart clothing and new combinations of advanced materials and intelligence have already changed sports equipment on a general level. Nanotechnology has expanded to equipment materials already in the 2000's. What comes to the development in the near future, the author had a chance to view materials of certain major and middle-sized sports equipment manufacturers provided by the assigner of this thesis. To protect the corporate operations and product development, the sources are officially confidential. For these reasons, the author has no right to mention the source companies but according to these sources, it is seeming that sports equipment is becoming more and more intelligent. Besides the interface mentioned by the author in part *Combining Material, Technology and Human*, the equipment will have intelligence of same nature as well. The equipment can have network and sensor connection, artificial intelligence, smart materials and connection to the user's body. Progress in battery technologies could also support the change in the nature of the equipment.

5.3.3 Organizational

As mentioned, the organizational aspects indicate global changes in social issues such as economy and public opinions.

Environmentalism

Environmental legislations, protocols, emission quotas and the lack of resources are a sign of a profound change. General awareness on sustainability will probably occur in such a scale that corporations are forced to reorganize their design, production, marketing and possibly the whole value chain according to new standards and consumer preferences.

Oneness vs. separation in economy

If cultures will singularize and if the middle classes continue their growth in the third World, a massive, global consumer market could form. In parallel, polarization of well-being is expected to occur in the West (op. cit. p. 16). The

ones with the higher income will have more well-being compared to the ones with the lower income.

5.3.4 Personal

These categories indicate the changes in a life of an average consumer. Thus, consuming trends, the standard of living, health and willingness to adopt new have a major role.

Health

Firstly, the technological revolution of healthcare will create solutions to global health issues. However, as the costs of healthcare will become higher, there are challenges to divide this form of technological abundance to everyone. Secondly, the wellness industry, as a wide concept, is expected to become a megatrend. (op. cit. p. 16-17.) How these two rather separate ways of progress behave with each other can be only speculated.

Consumption vs. non-consumption

As a possible result of polarization, transformation economy and environmentalism, a trend of avoiding overconsumption might arise in some form, either to prevent global problems or to avoid unnecessary costs. Nevertheless, this is an unsure scenario. Another issue in consumption vs. non-consumption is the division between generations. It is forecast that younger generations would be more interested to apply new technological devices than the older generations (op. cit. pp. 16, 17). But, as a conclusion, consumption trends, even when based on megatrend forecasts, are extremely challenging to predict.

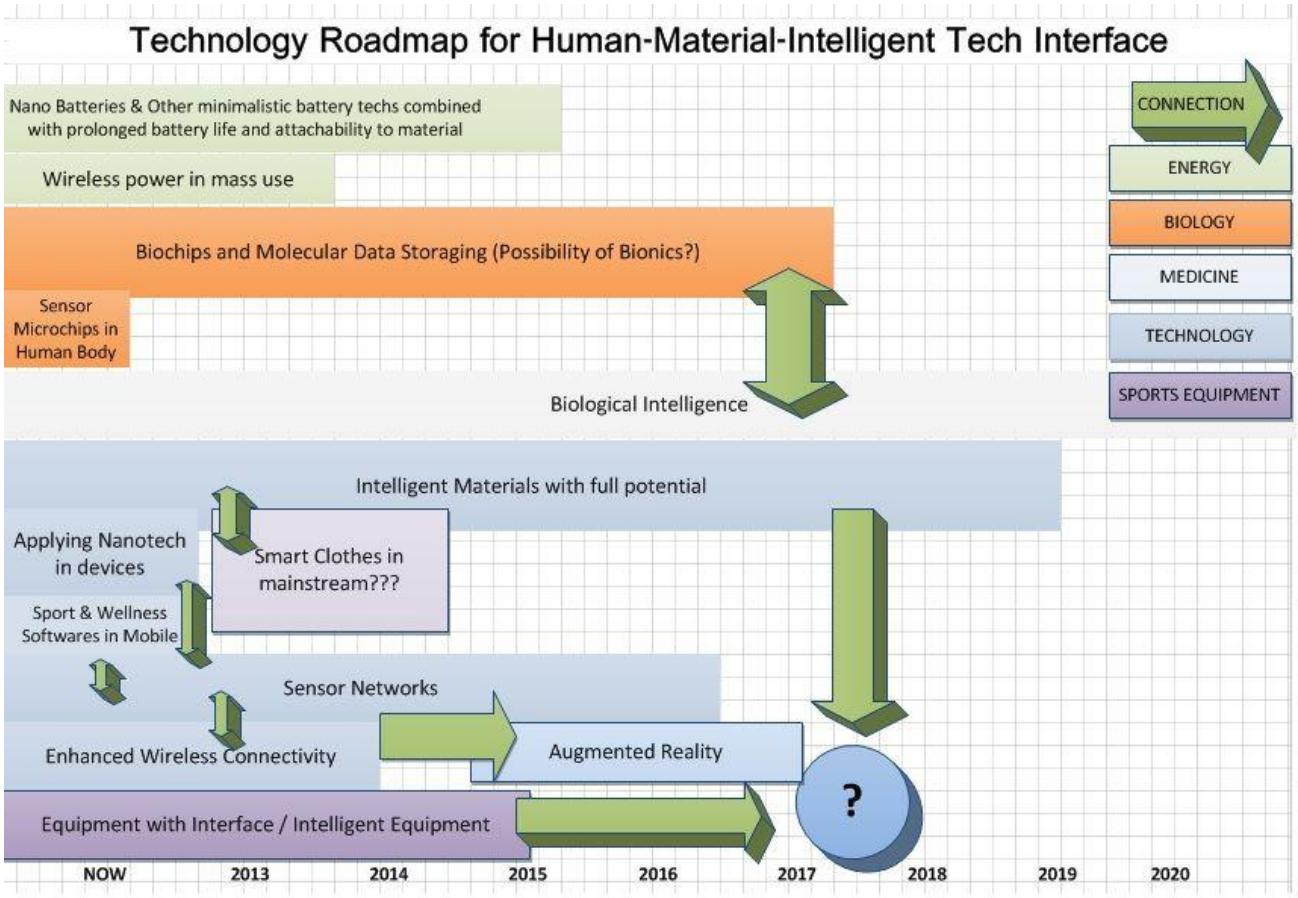
The author's thoughts on organizational and personal issues

The first issue rising from the organizational analysis is the importance of environmentalism. Enterprises may need to focus on sustainability issues in the whole value chain. New, responsible values could expand on a personal level as well, especially as the people with the higher income have a chance to choose by environmental standards instead of the sole price. The new division of purchasing

power both in the West and in the booming economies has its effects on marketing but its full implications cannot be forecast several years beforehand. Changes in resource prices or supply can force enterprises to find alternative materials even without the necessity to focus on environmental consumer trends.

6 TECHNOLOGY ROADMAP

FIGURE 1: Technology Roadmap by the author



(Mannermaa, 2004, 62-66, 233-246; Gartner, 2012; Finin, 2011)

A technology roadmap gives a visual glance on the forecast advancement of technologies and processes behind a certain product or product concept (op. cit. p. 9). In this case, it is applied to illustrate the progress of the key technologies concerning the sports and fitness applications. The horizontal points of time where each technology will reach their full potential are approximations. The

arrows point out the connection points that different technologies have. As the final stage of development, the interface can be forecast to be possible for utilization in 2017 or 2018. Thus, there is a chance to commercialize this interface by year 2020. The situation in 2012 was tagged as the starting point of the roadmap as the futures research was conducted then.

Nanotechnology and biotechnology are most suitable platforms for the new devices. Enhanced connectivity and sensor networks can be applied. Implementations of nanotechnology, e.g. nano chips, can function rather individually in the human body. Materials and technologies can be combined as a homogenous platform. Thus, the suggested technological platform for the sports and fitness applications is an interface of intelligent material, nanotechnology and the human body, added with a connection to sensor networks and other future networks. The actual software are impossible to predict but based on the sources, the author assumes that devices and application software will become a relatively singular platform. Chances to forecast the common mobile devices or communication platforms in 2020 are small because multiple development paths are progressing in parallel. Hence, connectivity with different platforms might become important.

7 THE AUTHOR'S DECISION ON THE TARGET SEGMENT

Based on the statements of Mohr (op. cit. pp. 9-10), the author suggests that the focus of the marketing of the innovations should be on the first two categories of adopters, innovators and early adopters. These two categories are easily attracted to new high-technology products and they require less marketing effort than the three slower groups of adopters. What comes to marketing concerning these slower categories, the author did not see it relevant to analyse them because a certain target segment must be chosen for this thesis and these two faster categories of adopters serve well for this purpose because their adoption potential is higher.

What comes to other major issues in this particular segmentation, the futures research gave more information on demographic, sociological and economic changes that are forecast to occur by year 2020. By applying the information gathered in the futures research, certain interesting target groups and changes in public opinion were pointed out.

Segmentation is a challenge, due to the possibility to form numerous possible target segments. Based on Mohr's statements (op. cit. pp. 9-10) and the findings of the futures research, the author suggests that for the sports and fitness applications, the factors having the most weight are adoption speed, and the need or want to use the applications provided by the industry combined with purchasing power. Due to the unsure nature of future forecasting, segmentation must be "soft", indicating that categorization must be done vaguely. However, certain factors could be seen attractive from a marketer's point of view.

Purchasing Power is one of the key factors in segmentation. As the markets of sports and fitness technology are relatively scoped, the applications are not a real *need* for mass consumers. Thus, finding a segment with a relatively high purchasing power is crucial. Added with the importance of polarization, it is relatively easy to see that the focus should be set on the groups having a relatively high income. Another possibility is that wellness could replace some aspects of institutional healthcare as the costs of the healthcare rise but this scenario is a sociological and political issue and goes beyond the subject of this thesis.

As the developing economies are booming and cultures will singularize (op. cit. pp. 15-16, 17), one solution could be to find possibilities to market applications for the growing middle class of the developing countries as they become more adoptive towards these new innovations. These people could be a massive market if approached properly. Despite they are an interesting segment as well, the author decided that the booming middle class in third World must be counted off from this research to focus on one single segment.

Also, the division between generations will become an issue. Despite the fact that the growing senior population will have a massive consumption power, their adoption speed of new innovations might be challenging in some cases. Instead,

Generation Y (born 1980-2000) have more potential to adopt new innovations without too much effort (op. cit. pp. 16-17). According to Pai (op. cit. pp. 5-6), the younger age groups use the sports and fitness applications more than the other age groups. By these means, the author assumed that focusing on Generation Y will also cause relative saves in marketing input. Women use these applications generally more than men do (op. cit. pp. 5-6).

However, the popularity of different applications among the genders is dependent on the nature and functions of the applications themselves and how a single application is designed. It depends on an application itself whether it is designed for men, women or for both genders. Along these lines, the chosen segment would have the characteristics described in the following table.

TABLE 3: Characteristics of the chosen target segment

Age	Generation Y (born 1980-2000), being 20-40 years old in 2020
Income	High Income
Interests	General interest in wellness (Wellness is expected to be a megatrend in any case)
Area	From North America & Europe
Adoption speed	Considered as “Innovators” or “Early Adopters” of technological innovations

8 FINDINGS OF THE QUALITATIVE ANALYSIS

What comes to the nature of the business environment, it was confirmed that general interest in wellness and personal health is considered to become popular among the segment. This is why the market is very potential but also crowded with businesses competing with each other. Thus, a business must differentiate with its applications and marketing. One important theme is also the nature of a global marketplace. Even when marketing these applications or gadgets locally,

an innovation must compete against global brands. As the markets are really global, the importance of international marketing skills will become high if a business is heading for international markets.

Accurate marketing trends for 2020 became impossible to forecast and one interviewee mentioned that "…it would be convenient enough to know the actual trends of the current or the following year first." Nevertheless, as the applications are used in a networked environment, the experts found the expected concept of augmented reality as a good marketing channel. So-called Big Data could be applied in optimizing the marketing communication for the target customers. Another issue that rose up is that the experts expected the amount of minimal, connected devices to grow in everyday life.

What comes to marketing for the segment, reference marketing was seen as the most important motivator in attracting new users and most of the interviewees saw the importance of reference marketing as the key in the promotion of the applications. Using sport stars in promotion was considered as a safe option but reference marketing was expected to have another dimension as well. Due to the fact that the segment will, assumingly, become somewhat reluctant towards traditional marketing communication such as advertising, a proper and relatively more effective marketing channel would be the users themselves. If an innovation has a high quality, information about it could be spread easily via networks, especially by means of group pressure which was considered as an important factor for the segment.

What comes to application development, the interviewees clearly noted that the applications should be designed to meet the needs and wants of the segment and the whole process should be customer centered. The product and the marketing should be designed and developed to match the views, values and wants of the target segment. According to one interviewee, "it is important to not market it as a technology, but as a solution." There should be interaction with the customers to make one's business and concept familiar for them. It was noted that many viable innovations of this field have failed because the businesses did not design them according to the preferences of the target customers.

Future sports applications should have certain characteristics. As in any marketing, it was found important that the product or application solves a problem that the customer has. Hence, it is necessary to find out the problem first and then develop a solution for it. For the chosen segment, it was found out necessary to create innovations that can be applied and used extremely easily and fast. The implementation should be as fast as possible, especially because the segment is expected to receive a load of advertisements and signals from many different sources and the competition in the sports and fitness application markets is forecast to become fierce by year 2020.

Hence, the products were suggested to be tested by enthusiastic users before entering the actual markets. Prototype testing and beta testing would give important information from the users and that way, the development can proceed to the right direction. Another practical issue that rose up was the need for compatibility of the application or solution with different platforms, technical standards and operating systems. If an application is compatible with different standards, the user can be more confident with the functioning of the application on a practical level. Also, the balance between the price and the quality of a product rose up. An application should be affordable and functioning at the same time. From a user point of view, online security and the security of personal information is critical and thus, the applications should be as safe as possible in this sense.

The most important challenges on a practical level were stated to be access to expertise, the great possibility of failures and privacy issues. A business must have right personnel in marketing and development to succeed. Secondly, failures are to be expected and by several mistakes, learning process can lead to the right path. Thirdly, the growing access to data creates a conflict against the privacy of the users, especially as the segment is aware of their privacy issues in different networks.

10 CONCLUSION BY THE AUTHOR

10.1 Results

The research questions were as follows:
“Which technologies can be forecast to create customer value in 2020 in the area of sports and fitness mobile applications?”

“What would be a proper target segment for these applications?”

“Which would be the most efficient ways to conduct the marketing of the forecast application technology for this segment?”

The author found answers to these research questions. First, there is a forecast about the future technologies that create the basis for future applications on a physical level. Secondly, the author suggests a target segment for the marketing of the applications. Important factors concerning the marketing of the forecast technological interface for the chosen segment were found out.

On a technological level, the author suggests that future applications of the field will create customer value through combining technologies. This interface will include enhanced virtual connectivity with sensor networks or other future networks, intelligent material or equipment, and the devices’ ability to be connected to a biological (human) body. This interface could be built implementing nanotechnology or biotechnology. However, the technology itself is not the actual solution. Instead, it is the application of the combined technologies. Accurate software and operating systems cannot be yet forecast. Details of this technological interface are described in chapter 6.

The author suggests that a proper target segment has the following characteristics in 2020; age from 20 to 40 years, located in Western Europe and North America, a high income level, a general interest in wellness and a fast adoption speed of technological innovations. Other interesting target segments such as the booming middle class in Asia were not analyzed in this thesis.

By applying a qualitative analysis, the author found the following issues important in marketing the mentioned technological interface for the target segment. As the

market of fitness and sports applications is expected to boom and become crowded with numerous businesses competing with each other, a business should have the abilities to differ from others both through extremely functional products and an interesting, even unorthodox way of marketing. The nature of the marketplace is expected to become global, which means that even a local business must compete with big corporations to gain the attention of the customers. Hence, a highly professional team is a key to commercial success.

The applications should be designed and developed according to the needs and wishes of the target segment, even by interacting with the first users by trying prototype testing and beta testing. The actual marketing should also be planned to meet the values of the segment. In general, finding a solution to a customers' problem is the key. In the future, personalized marketing by using "Big Data" and other concepts of future networks could be applied for this purpose. Certain characteristics can add commercial potential to an application. The most important of these characteristics are expected to be extremely good information security to protect personal data, fast implementation of the innovation (indicating that a new user can immediately start using) and compatibility with multiple operating systems and standards. To generalize, the superior quality of products is a cornerstone of success.

Concerning the applications, marketing communication should be somewhat different from mass marketing or advertising and it should focus more on the potential users. The development of digital networks will, most probably, create a highly potential marketing channel. Social media, whatever its nature will be in 2020, will be one channel in addition to augmented reality and other future networks. Group pressure and reference marketing are very important for the segment. For the actual PR, sports stars and other celebrities or experts of the field can have a role as a powerful reference. Marketing communication in future networks can also be optimized and personalized to attract users on a personal level.

10.2 Discussion

The background of the subject was vast and although the author found certain answers to the specific research problem, there are many subjects available for further research in the future. The most important issue emerging from this research is the possibility of the applications and devices becoming more integrated and thus, it may be difficult to distinguish them as separate technologies in 2020. Certain technological innovations can also become obsolete during the following years, and this can change the nature of mobile applications as a concept. Another issue is the unsure nature of the software or operating systems used in future applications.

As for marketing and application design, it would be a good idea to research the subject by different segmentation. As mentioned in the introduction, women are more willing to accept these applications (op. cit. pp. 5-6), and it would be interesting to research the differences in the use of these applications between the sexes. Other segments, such as the middle class in the developing economies, would also be interesting as well for the marketers of these applications. According to the futures research, environmental concerns and other sustainability related changes in the consumer trends can have an impact on consumer marketing on a general level. How these changes will be manifested in 2020 on this scoped market can be difficult to forecast but they remain an interesting trend.

11 VERIFICATION OF THE FINDINGS

11.1 Validity

Futures research is transferable as the main technological development paths and megatrends are universal concepts despite the nature of future as a changing and unsure phenomenon. Hence, the author believes that the results of futures research can be generalized. Accurate technological solutions could not be predicted. Instead, vague concepts were found. What comes to the validity of the qualitative analysis, the author focused on objectivity, reliability and neutrality when analyzing the interviews. The results of the qualitative analysis are based on the answers of the interviewees. The results of the qualitative analysis are more or less case-specific. The methodologies used both in the futures research and in the qualitative analysis are reported. The author also found certain answers to the research problem.

11.2 Reliability

The research process and methods are described and documented and thus, the research is repeatable in a similar manner. In the environmental scanning, multiple sources were applied to ensure a sufficient amount of information and saturation. In the qualitative analysis, the author had to rely the findings on the interviewees' answers and subjective views and analyze them as neutrally and objectively as possible. The qualitative research conducted has a nature of high reliability and measurability as the practical approach to the qualitative analysis was described in the chapters describing the methodology. The author relies on the secondary data in the futures research and segmentation and has attempted to avoid subjective interpretation. Applying secondary data in the futures research and segmentation and primary data in the qualitative analysis is a form of triangulation as well.

One main problem with the reliability of this thesis is the lengthened time scale of the work as the futures research was conducted in autumn 2012, one and a half

a year before the completion of the thesis and the actual technological progress may have had slight changes. Considering the reliability of the futures research, the changing and unsure nature of the phenomenon itself is a limitation. Despite these problems, the author likes to mention that concepts like megatrends are rather stable in their nature and the most important development paths are well forecast and reported in secondary sources. The author relied on futurological literature and business related documents and reports dealing with these issues. Although some source books were rather old (10-15 years), they described the future megatrends in a similar manner with the new materials because megatrends are stable and predictable.

Technological innovations themselves could be forecast accurately and thus, the author could rely on technological development paths only in a vague manner, meaning that accurate innovations or software have not been mentioned in the technology roadmap but certain technological development paths, such as the progress in nanotechnology or mobile connections are rather relevant to mention.

As for saturation in the qualitative research, many of the interviewees had similar answers considering some subjects. However, each interviewee described the issues from their personal point of view and relying on their own professional experience. This resulted as several points of view, especially on certain marketing issues. After four interviews, the similarity of answers and saturation could already be noticed.

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APPENDICES

The document in Appendix 1 was provided as a background material for the interviewees before the expert interviews. The interview questions are included on the second page of the document (p. 39). Appendix 2 consists of a flow chart describing the whole research process of this thesis.

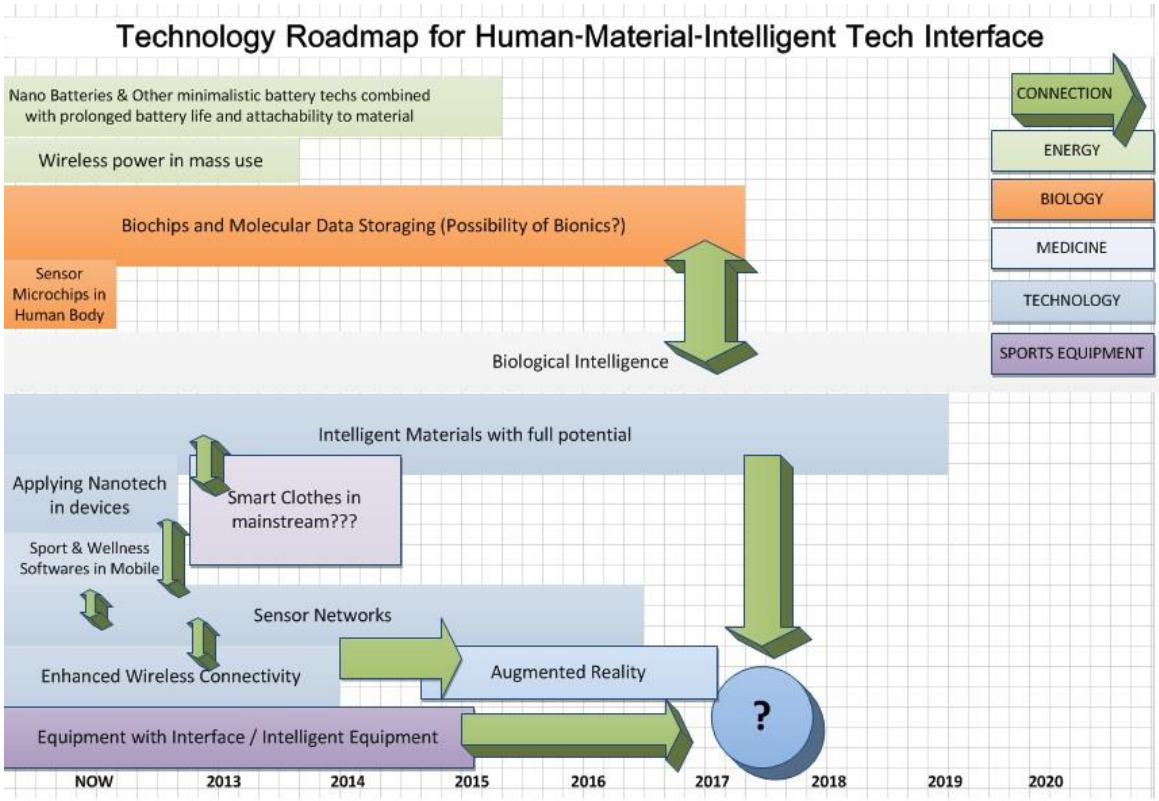
Future Marketing Opportunities for Sports and Fitness Mobile Applications

Technology

The author expects the future platform of sports equipment to base on the following technologies and their development during this decade;

- Enhanced connectivity and development of virtual networks creating new possibilities for data transfer and ability to be connected “anywhere, anytime”
- Combining material, technology and human; Nanotechnology and the becoming solutions of biotechnology will allow mixing of technological equipment and human body
- Intelligent equipment; The sports apparel and equipment can have intelligence themselves

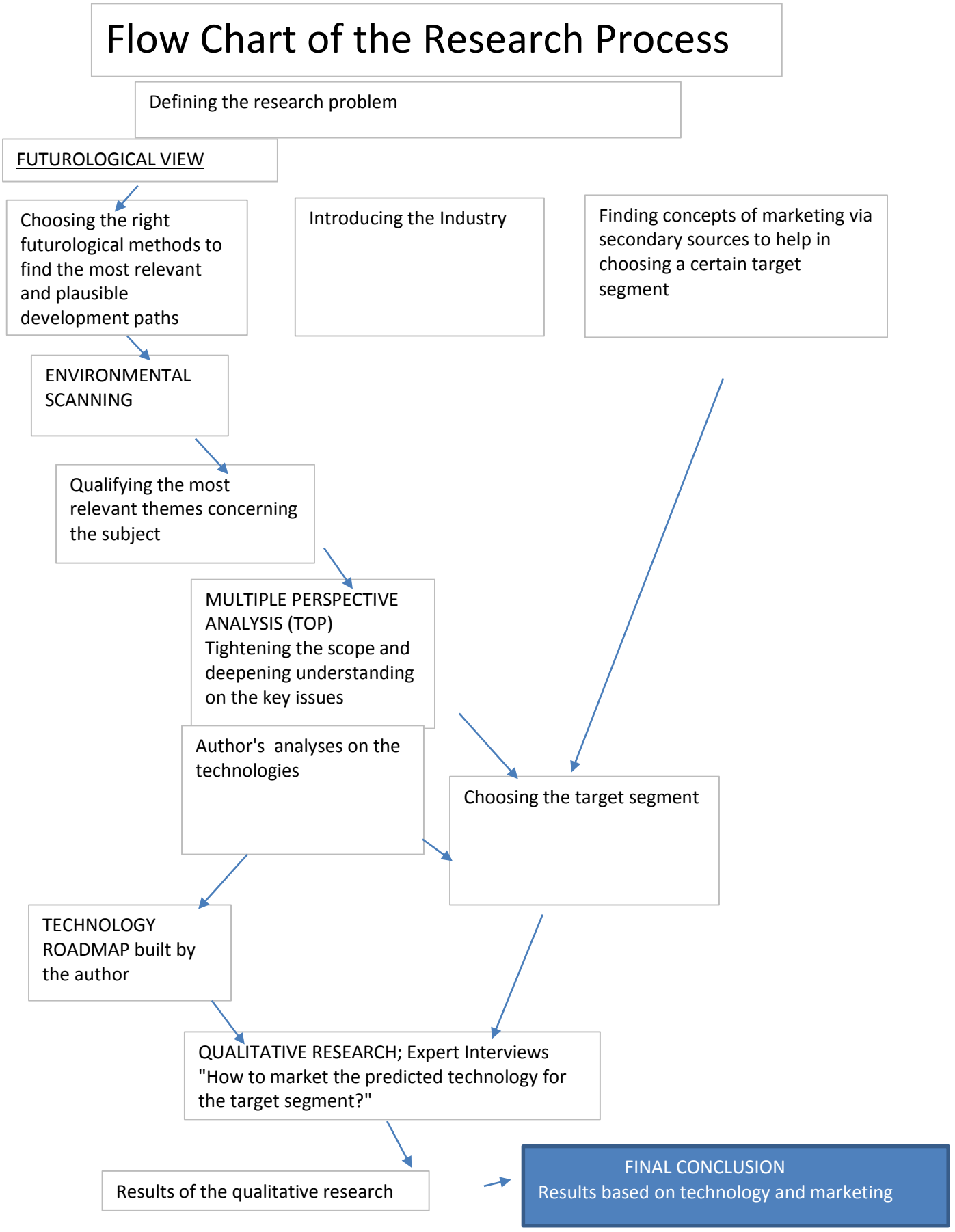
Below a Technology Roadmap for the technologies described;



Characteristics of the chosen segment

- Generation Y (born 1980-2000), being 20-40 years old in 2020
- High Income
- General interest in wellness (Wellness is expected to be a megatrend in any case)
- From North America & Europe
- Considered as “Innovators” or “Early Adopters” of technological innovations, indicating a fast adoption speed of new technologies

1. What do You consider to be the most important issues in consumer marketing in year 2020?
2. In general, what factors do You find most important when marketing for the proposed segment?
3. What changes would You predict to occur in the sports and fitness markets by year 2020?
4. What tips or advice would You give for a company marketing the forecasted technological interface?
5. Do You have suggestions how to conduct marketing of the forecasted technology for the chosen segment? What kind of suggestions?
6. What challenges do You find in marketing the forecasted technological interface for the chosen segment?
7. Is there anything important You would like to add concerning the technologies at hand or is there something important we did not discuss concerning the subject?


Flow Chart of the Research Process
Defining the research problem
FUTUROLOGICAL VIEW
Choosing the right futurological methods to find the most relevant and plausible development paths
Introducing the Industry
Finding concepts of marketing via secondary sources to help in choosing a certain target segment
ENVIRONMENTAL SCANNING
Qualifying the most relevant themes concerning the subject
MULTIPLE PERSPECTIVE ANALYSIS (TOP)
Tightening the scope and deepening understanding on the key issues
Author's analyses on the technologies
Choosing the target segment
TECHNOLOGY ROADMAP built by the author
QUALITATIVE RESEARCH; Expert Interviews
"How to market the predicted technology for the target segment?"
Results of the qualitative research
FINAL CONCLUSION
Results based on technology and marketing